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A CHAPTER ON RAINBOWS IN LANDSCAPES.

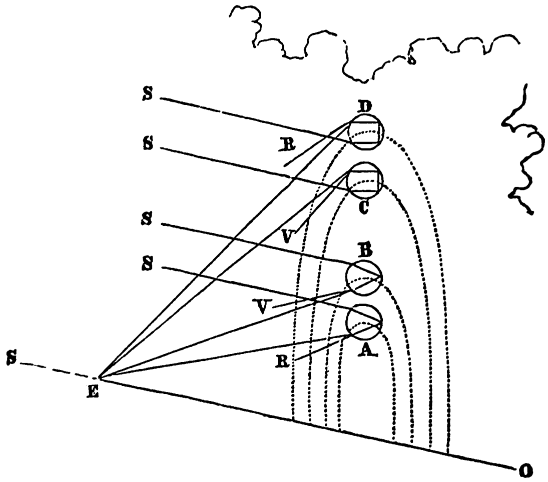
We have lately seen some landscapes, where it has pleased the artist to introduce a rainbow, either entire or in parts. It is not our task to defend "conventionalities or the fetters which European prejudices have imposed on Art;" we only wish the artist would use his discretion with the size of his canvas, chastity in his effects, his knowledge as to the fewest and most durable colors, and not abuse with superfluities or put the same in their proper place if he wishes to make use of any. But since we can do without gilt haloes in Raphael's virgins, we certainly do not wish for rainbows in better class landscapes.

As we have said, we had seen some new landscapes with rainbows, which former are held up to beginners and amateurs as worthy of imitation; we wish to say a few words about rainbows in particular.

A rainbow (*vide* Webster) is a bow or an arch of a circle, consisting of all the colors formed by the refraction and reflection of rays of light from drops of rain or vapor, appearing in the part of the hemisphere opposite to the sun.

Refraction (*ibid.*) signifies in optics the change in the direction of a ray of light, caused by the difference of density in the medium or mediums through which it passes. And reflection means a turning back after striking upon any surface, as the reflection of light, heat or sound. The angle of incidence and the angle of reflection are always equal.

The following diagram will explain the process the rays of the sun have to undergo in order to create a rainbow in the eye of a spectator.

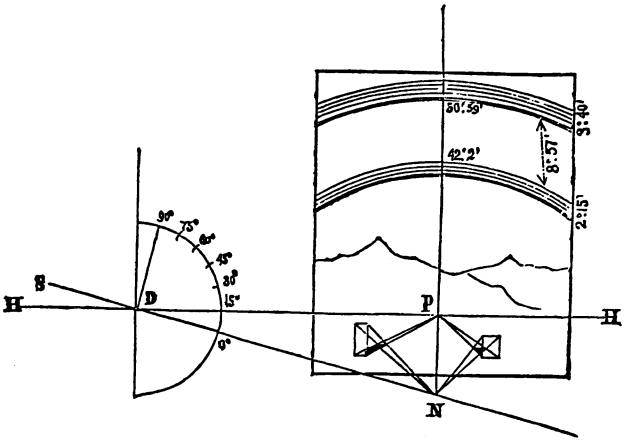


Let A, B, C, D, be four globules of rain in a cloud covering a considerable part of the heavens on one side of the horizon. Let E be the eye of the spectator, and, on account of the remoteness of the sun, let the rays of light which proceed from his disk be considered as parallel to one another. Let S E be a line drawn from the sun through the eye of the spectator, and let it be produced towards O; also let S A, S B, etc., be very slender rays (supposed at present to be of one color) falling upon the globules of water. Let the rays of light falling upon the globules A and B submit to a refraction at entering, to one reflection at the opposite surface, and to a refraction at leaving the globules. Let, on the other hand, the rays falling upon the globules C and D, have a refraction at entering, a double reflection at the opposite surface, and a refraction at leaving. Suppose lines to be drawn from the points of emergence to E. Descartes has found that if the angle A E O or B E O were nearly equal to 42° (degrees), and if the angles C E O or D E O were nearly equal to 52°, the eye would be affected by a sensation of brightness; therefore, if the lines A E, B E, etc., were to revolve conically about E O as an axis, all the globules of rain upon the conical surfaces so described, would send pencils of parallel rays to the eye, and two concentric arches of bright light would be seen in the heavens.

To Newton is due the law of refrangibility for the different colored rays which compose a pencil of white or compounded light, and he was able to assign the cause of the colored bands in the rainbow, the order of their position and the breadth which they must occupy. He fixed the angle A E O = 40° 17′, and that at this angle the violet rays alone, after two refractions and one reflection will enter the eye of the spectator at E, the other rays falling below; and when the angle B E O =42° 2′, the red rays alone will enter the eye, the violet rays passing above. Again, when the angle C E O = 40° 59′, the red rays only will enter the eye after two refractions and two reflections, the violet rays falling below; and when the angle D E O = 54° 9′, the violet rays alone will enter, the red passing above. If the interval between the drops C and D and between the drops A and B were occupied by other drops, it may readily be imagined that the pencils of parallel rays which come from them to the eye, would be of all the prismatic colors between the red and violet, and that thus there would appear in the heavens two narrow spectra: the length of that between A and B would be 1° 45′, and the length of that between C and D would be 3° 10′. But as the pencils S A, S B, etc., do not come from from the centre only of the sun's disk, but also from each point of it, the diameter of the sun's disk, being 30′ has to be added to each of the above named lengths of the spectra, and we have, therefore, for the interior bow 2° 15′, and for the exterior 3° 40′. In both bows the colors between the red and the violet are less distinct than those two colors, on account of the interference of the colored light from all parts of the disk. The transmission of light from the outer bow, after having passed two reflections will be less distinct than from the inner bow, and, therefore, the former will be fainter than the latter. The interval between the two bows has been sometimes observed to be occupied by an arch of faint colored light; this is ascribed to the reflection of one of the bows.

A rainbow can never be greater than a semi-circle if the spectator be not on elevated ground, for if it were, the centre of the bow would be above the horizon, and the sun, which is in a line drawn through that centre and the eye, would then be below the horizon; but in this case the sun could not shine on the drops of rain, and consequently there would be no bow. When the rain-cloud is of small extent, there is seen only that part of the bow, which the cloud can form; yet the bow is seen sometimes against the blue sky, when there exists in the air vapors which are not dense enough to be visible in the form of a cloud.

The following diagram will show how to apply the rainbow to a landscape.



The sun S is taken at 15° above the horizon H, and stands in the principal vertical plane behind the back of the spectator. N is the centre of the two bows, the height and breadth of which are fixed by lines drawn from D through the corresponding degrees in the quadrant.

The higher the sun is in the heavens the lower the rainbow has to appear in the picture, and vice versa. If the sun is in the meridian in a southern latitude, no rainbow is possible.

If the sun is not in the principal vertical plane of the picture, but at an angle of 45° either to the right or left, the two bows will arise from the horizon of the painting at the point or near the intersection with the vertical plane. But be it here remarked that the bows must be constructed "in perspective" as soon as the sun is not in the vertical plane. It will be seen by the above diagram that the rainbow complete, with the sun at 15° above the horizon, extends to about 90°, or over the fourth part of our visible horizon, which is about the greatest extent the painter dare put on canvas without giving a diorama or a panoramic view. Great care must also be taken by the artist that the direction of the light and shade in his landscape, and, consequently, the position of the sun he has taken, do not forbid in toto the appearance of a rainbow; or that he begins the limb of a rainbow in a situation of which the centre does not go through the eye of the spectator to the sun, as is the case with many of the landscapes referred to in the beginning of this chapter.

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THE NATURE OF POETRY.

There is a large class of persons, to whom all that belongs to our political and social existence seems of such absorbing interest, that they look with impatience on anything which does not bear directly on it. A great political authority of the present day has counselled the young men of this country, and especially of the working classes, not to waste their time on literature, but to read the newspapers, which, he says, will give them all the education that is essential. Persons of this class seem to fancy that the all-in-all man is "to get on;" according to them, to elevate men means, chiefly, to improve their circumstances. . . . .

If, indeed, to have enough to eat and enough to drink were the whole of man—if the highest life consisted in what our American brethren call "going ahead"—if the highest ambition for working men were the triumph of some political faction, then, assuredly, the discussion of our present subject would be waste of breath and time. But it appears to me, that in this age of mechanics and political economy, when every heart seems "dry as summer dust," what we want is, not so much, not half so much—light for the intellect, as dew upon the heart; time and leisure to cultivate the spirit that is within us.

The subject which the author refers to is the influence of poetry on the working classes; his thought, certainly, appeals to a large audience. The author we quote from, Robertson, now deceased, was a clergyman of the church of England, in the town of Brighton. He, with the brothers Hare, Maurice, and some others, disciples of Coleridge, form a starry group in the literary firmament of the age; they are the "younger clergy," as they are called by a distinguished writer, who have widened the realm of intellect in accordance with traditional opinions, by developing the philosophical tenets of Coleridge, in conjunction with the duties and conditions of their clerical office. We are inclined to think that Robertson has done more good than any of them. His "Lectures and Addresses," and his "Sermons," are adapted to the comprehension of working-men; he associated with working-men, knew their wants, and compassed the limits of their intelligence. Through this knowledge he has fitted the treasures of his culture to common life; he has brought down poetry from the skies to the shops and dwellings of laborers; he had the rare honor of stimulating a working-men's association into a quarrel concerning the merits of great poets, and again of calming the waves of partisanship. If he did not possess the genius of St. Augustine, he had the spirit of that noble reformer, and the community in which he labored profited by it.

So many people ask what art is, we may reasonably conclude that there are as many who would like to